

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

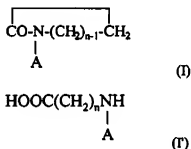
1-10. (Canceled)

11. (Currently Amended) A toughened nylon, comprising:

a matrix nylon; and

a long-chain nylon,

the matrix nylon is prepared by homopolymerization or copolymerization of cyclic lactam monomers or their corresponding amino acids, the structure of said cyclic lactam is represented by Formula (I) and the structure of said amino acid is represented by Formula (I');



in Formula (I) and (I') A is an alkyl group including 1-8 carbon(s) and $3 \leq n \leq 11$;

the long-chain nylon is at least one selected from the group consisting of nylon-1010, nylon-1111, nylon-1212, nylon-1313, nylon-46, nylon-66, nylon-610, nylon-612, nylon-613, nylon-1011, nylon-1012, nylon-1213, nylon-8, nylon-9, nylon-11, nylon-12, nylon-13, poly(2,2,4-trimethyl hexamethylene terephthalamide), co-condensation nylon 6/7, co-condensation nylon 6/10, co-condensation nylon 6/12, co-condensation nylon 6/13, co-condensation nylon 10/11, co-condensation nylon 10/12, co-condensation nylon 12/13, nylon-6T and nylon-10T; and

a [[the]] proportion of said long-chain nylon in the total weight of the toughened nylon is 2-45%; as the toughened nylon has only one melting peak detected with differential scanning calorimetry.

12. (Previously Presented) The toughened nylon according to claim 11, wherein the proportion of said long-chain nylon in the total weight of the toughened nylon is 6-25%.

13. (Currently Amended) The toughened nylon according to claim 11, wherein said cyclic lactam monomer is at least one selected from the group consisting of N-methyl hexanolactam, N-n-octyl nonanolactam, and N-t-butyl dodecanolactam; and

~~said corresponding amino acid is selected from the group consisting of ω -amino butanoic acid, ω -amino pentanoic acid, ω -amino hexanoic acid, ω -amino heptanoic acid, ω -amino octanoic acid, ω -amino nonanoic acid, ω -amino decanoic acid, ω -amino undecanoic acid and ω -amino dodecanoic acid.~~

14. (Currently Amended) A preparation process of toughened nylon according to claim 11, the preparation process comprising:

a dissolution step of said long-chain nylon resin in said lactam monomer or its corresponding amino acid; and

a polymerization step of said lactam monomer or its corresponding amino acid;

wherein the dissolution step and the polymerization step are conducted simultaneously, or wherein the dissolution step is performed and then the polymerization step is carried out in a solution obtained from the dissolution step.

15. (Currently Amended) The preparation process according to claim 14, wherein said polymerization step includes a casting process.

16. (Currently Amended) The preparation process according to claim 14 ~~[[15]], further comprising wherein said polymerization step includes a casting process, such that the preparation process comprises:~~

dissolving said long-chain nylon resin in melted cyclic lactam monomer or its corresponding amino acid;

dehydrating;

then adding catalyst and dehydrating again, raising the temperature to 120-200°C and adding catalyst promoter to obtain a resulting contents;

transferring [[in]] the resulting contents into a preheated mould immediately and carrying out polymerization in an oven at 150-250°C to obtain the toughened nylon.

17. (Currently Amended) The preparation process according to claim 14 [[15]], ~~further comprising wherein said polymerization step includes a reacting extrusion process, such that the preparation process comprises:~~

~~in a first reactor,~~ adding and dissolving said long-chain nylon resin in cyclic lactam monomer or its corresponding amino acid as contents in a first reactor;

dehydrating in vacuum the contents in the first reactor;

in the first reactor, adding a catalyst and continue dehydrating in vacuum;

~~in a second reactor,~~ adding cyclic lactam monomer or its corresponding amino acid and a catalyst promoter as contents in a second reactor, and dehydrating in vacuum;

then adding the contents of the first and the second reactors into an extruder for polymerization; and

setting the temperature of polymerization section at 220-250°C and adjusting a screw speed so that a residence time of material in a screw is 0.5-7 minutes, and the toughened nylon is obtained as an extruded product.

18. (Currently Amended) The preparation process according to claim 14 [[15]], ~~further comprising wherein said polymerization step includes a hydrolysis polymerization process, such that the preparation process comprises:~~

adding said long-chain nylon resin to cyclic lactam monomer or its corresponding amino acid;

heating and dissolving;

adding water and conducting hydrolysis polymerization at 200-250°C and 10-20 MPa;

depressurizing after 0.5-6 hours and dehydrating in vacuum; and

continuing polymerization to further increase viscosity to obtain the toughened nylon.

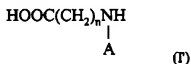
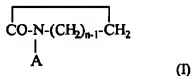
19. (Previously Presented) The application of toughened nylon prepared according to claim 11 in the manufacture of gears, bearings, precise instrumental parts and automobile parts.

20. (Currently Amended) A toughened nylon, comprising:

a matrix nylon; and

a long-chain nylon,

the matrix nylon is prepared by the homopolymerization or copolymerization of cyclic lactam monomers or their corresponding amino acids, the structure of said cyclic lactam is represented by Formula (I) and the structure of said amino acid is represented by Formula (I');



in Formula (I) and (I') A is an alkyl group including 1-8 carbon(s) and $3 \leq n \leq 11$;

the long-chain nylon is at least one selected from the group consisting of nylon-1010, nylon-1111, nylon-1212, nylon-1313, nylon-46, nylon-66, nylon-610, nylon-612, nylon-613, nylon-1011, nylon-1012, nylon-1213, nylon-8, nylon-9, nylon-11, nylon-12, nylon-13, poly(2,2,4-trimethyl hexamethylene terephthalamide), co-condensation nylon 6/7, co-condensation nylon 6/10, co-condensation nylon 6/12, co-condensation nylon 6/13, co-condensation nylon 10/11, co-condensation nylon 10/12, co-condensation nylon 12/13, nylon-6T and nylon-10T; and

the toughened nylon is prepared by the polymerization of said cyclic lactam monomer or their corresponding amino acids in the existence of said long-chain nylon as a toughening agent, wherein a proportion of said long-chain nylon used as the toughening agent in the total weight of the toughened nylon is 2-45%.

21. (Previously Presented) The toughened nylon according to claim 20, wherein the proportion of said long-chain nylon used as the toughening agent in the total weight of the toughened nylon is 6-25%.

22. (Currently Amended) The toughened nylon according to claim 20, wherein said cyclic lactam monomer is at least one selected from the group consisting of N-methyl hexanolactam, N-n-octyl nonanolactam, and N-t-butyl dodecanolactam; ~~and~~

~~said corresponding amino acid is selected from the group consisting of ω -amino butanoic acid, ω -amino pentanoic acid, ω -amino hexanoic acid, ω -amino heptanoic acid, ω -amino octanoic acid, ω -amino nonanoic acid, ω -amino decanoic acid, ω -amino undecanoic acid and ω -amino dodecanoic acid.~~

23. (Currently Amended) A preparation process of toughened nylon according to claim 20, the preparation process comprising:

a dissolution step of said long-chain nylon resin in said lactam monomer or its corresponding amino acid; and

a polymerization step of said lactam monomer or its corresponding amino acid;

wherein the dissolution step and the polymerization step are conducted simultaneously, or wherein the dissolution step is performed and then the polymerization step is carried out in a solution obtained from the dissolution step.

24. (Currently Amended) The preparation process according to claim 23, wherein said polymerization step includes a casting process.

25. (Currently Amended) The preparation process according to claim 23 [[24]], ~~further comprising wherein said polymerization step includes a casting process, such that the preparation process comprises:~~

~~dissolving said long-chain nylon resin in melted cyclic lactam monomer or its corresponding amino acid;~~

~~dehydrating;~~

then adding a catalyst and dehydrating again, raising the temperature to 120-200°C and adding a catalyst promoter to obtain a resulting contents;

transferring [[in]] the resulting contents into a preheated mould immediately and carrying out polymerization in an oven at 150-250°C to obtain the toughened nylon.

26. (Currently Amended) The preparation process according to claim 23 [[24]], ~~further comprising wherein said polymerization step includes a reacting extrusion process, such that the preparation process comprises:~~

~~in a first reactor~~; adding and dissolving said long-chain nylon resin in cyclic lactam monomer or its corresponding amino acid as contents in a first reactor;

dehydrating in vacuum the contents in the first reactor;

in the first reactor, adding a catalyst and continuing the dehydrating in vacuum;

~~in a second reactor~~; adding cyclic lactam monomer or its corresponding amino acid and a catalyst promoter as contents in a second reactor, and dehydrating in vacuum;

then adding the contents of the first and the second reactors into an extruder for polymerization; and

setting a temperature of polymerization section at 220-250°C and adjusting a screw speed so that a residence time of material in a screw is 0.5-7 minutes, and the toughened nylon is obtained as an extruded product.

27. (Currently Amended) The preparation process according to claim 23 [[24]], ~~further comprising wherein said polymerization step includes a hydrolysis polymerization process, such that the preparation process comprises:~~

adding said long-chain nylon resin to cyclic lactam monomer or its corresponding amino acid;

heating and dissolving;

adding water and conducting hydrolysis polymerization at 200-250°C and 10-20 MPa;

depressurizing after 0.5-6 hours and dehydrating in vacuum; and

continuing polymerization to further increase viscosity to obtain the toughened nylon.

28. (Previously Presented) The application of toughened nylon prepared according to claim 20 in the manufacture of gears, bearings, precise instrumental parts and automobile parts.
29. (Currently Amended) The preparation process according to claim 14, wherein said polymerization step includes reacting extrusion.
30. (Currently Amended) The preparation process according to claim 14, wherein said polymerization step includes hydrolysis polymerization.
31. (Currently Amended) The preparation process according to claim 14, wherein said polymerization step includes solid phase polymerization.
32. (Currently Amended) The preparation process according to claim 23, wherein said polymerization step includes reacting extrusion.
33. (Currently Amended) The preparation process according to claim 23, wherein said polymerization step includes hydrolysis polymerization.
34. (Currently Amended) The preparation process according to claim 23, wherein said polymerization step includes solid phase polymerization.